

Form PTO-1449  
(REV. 8-83)U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.

015685.P031

SERIAL NO.

09/676,887

APPLICANT

Roger Rogard

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## INFORMATION DISCLOSURE CITATION

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## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>DR</i>	3,704,465	11/28/72	Masak et al.	—	—	
<i>DR</i>	3,774,209	11/20/73	Fleming et al.	—	—	
<i>DR</i>	3,798,645	03/19/74	Baurle et al.	—	—	
<i>DR</i>	3,852,749	12/03/74	Kohler	—	—	
<i>DR</i>	3,946,385	03/23/76	Ewen	—	—	
<i>DR</i>	4,005,379	01/25/77	Lerner	—	—	
<i>DR</i>	4,035,746	07/12/77	Covington Jr.	—	—	
<i>DR</i>	4,085,319	04/18/78	Deitz et al.	—	—	
<i>DR</i>	4,128,740	12/05/78	Graziano	—	—	
<i>DR</i>	4,263,568	04/21/81	Nemit	—	—	
<i>DR</i>	4,316,191	02/16/82	Sawatari et al.	—	—	

## FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
2 237 706 A	5/8/91	United Kingdom	—	—	
2 295 524 A	5/29/96	United Kingdom	—	—	
2 313 261 A	11/19/97	United Kingdom	—	—	

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

<i>DR</i>	Agee, "Blind Separation and Capture of Communication Signals Using A Multitarget Constant Modulus Beamformer", 10/7/89 Proc. IEEE Military Communications Conference, Vol. 2, pp. 1-12.
<i>DR</i>	Aschied et al., "An All Digital Receiver Architecture for Bandwidth Efficient Transmission at High Data Rates", 1989, IEEE Transactions on Communications, Vol. 37, No. 8, pp. 804-813.

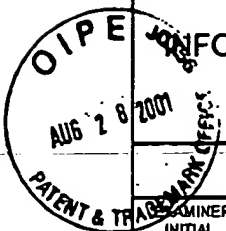
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00	4,375,622	03/01/83	Hollingsworth et al.			
	4,434,505	02/28/84	Gutleber			
	4,475,010	10/02/84	Huensch et al.			
	4,626,859	12/02/86	Stansfield			
	4,639,732	01/27/87	Acoraci et al.			
	4,639,914	01/27/87	Winters			
	4,658,096	04/14/87	West, Jr. et al.			
	4,737,794	04/12/88	Jones			
	4,737,975	04/12/88	Shafer			
	4,742,356	05/03/88	Kuipers			
✓	4,750,147	06/07/88	Roy, III et al.			

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DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
					YES	NO
0 639 035 A1	2/15/95	EPO				
0 713 261 A1	5/22/96	EPO				
0 777 400 A2	6/4/97	EPO				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

0	Franks, "Synchronization Subsystems: Analysis and Design", 1981, Digital Communications Satellite/Earth Station Engineering, pp. 294-335.
0	Friedlander, "Direction Finding Using an Interpolated Array", 4/3/90, International Conference on Acoustics, Speech, and Signal Processing, Vol. 5, pp. 2951-2954.
0	Friedlander et al., "Direction Finding for Wideband Signals Using an Interpolated Array", 1991, IEEE Publication, pp. 583-587.

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DO	4,775,997	10/04/88	West Jr. et al.			
	4,796,291	01/03/89	Makino			
	4,827,395	05/02/89	Anders et al.			
	4,829,554	05/09/89	Barnes et al.			
	4,837,800	06/06/89	Freeburg et al.			
	4,855,748	08/08/89	Brandao et al.			
	4,910,794	03/20/90	Mahany			
	4,922,517	05/01/90	West, Jr. et al.			
	4,926,186	05/15/90	Kelly et al.			
	4,940,963	07/10/90	Gutman et al.			
↓	4,947,452	08/07/90	Hattori et al.			

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					YES	NO
DO 95/34103	12/14/95	WO				
DO 98/01963	1/15/98	WO				
DO 98/17037	4/23/98	WO				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

DO	Ganz et al., "A Data-Derived Reference Signal Technique for Adaptive Arrays", IEEE Transactions on Communications, Vol. 37, No. 9, 9/1989, pp. 975-983.
DO	Ittis et al., "A Digital DS Spread-Spectrum Receiver With Joint Channel and Doppler Shift Estimation", IEEE Transactions on Communications, Vol. 39, No. 8, 8/1991, pp. 1255-1267.

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00	4,955,082	09/04/90	Hattori et al.	—	—	
	4,965,732	10/23/90	Roy, III et al.			
	4,965,849	10/23/90	Kunihiro			
	4,965,850	10/23/90	Schloemer			
	4,972,151	11/20/90	Rosen			
	4,989,204	01/29/91	Shimizu et al.			
	5,041,833	08/20/91	Weinberg			
	5,052,799	10/01/91	Sasser et al.			
	5,093,924	03/03/92	Toshiyuki et al.			
	5,103,459	04/07/92	Gilhausen et al.			
✓	5,109,535	04/28/92	Kume et al.			

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					YES	NO
00 98/17071	4/23/98	WO	—	—		

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00	Lee et al., "Decision Directed Carrier Recovery - Chapter 16: Carrier Recovery", 1994 Digital Communications, 2nd Edition, Kluwer Academic Pub., pp. 725-736.
00	Lee et al., "Decision Directed Carrier Recovery - Chapter 17: Timing Recovery", 1994 Digital Communications, 2nd Edition, Kluwer Academic Pub., pp. 737-764.
00	Lundell et al., "Applications of the Constant Modulus Adaptive Beamformer to Constant and Non-Constant Modulus Signals", Proceedings, 1998 Asilomar Conference on Signals, Systems, and Computers (ACSSC-1998), pp. 432-436.

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DS	5,124,697	06/23/92	Moore	—	—	
	5,142,253	08/25/92	Mallavarpu et al.			
	5,159,593	10/27/92	D'Amlco et al.			
	5,255,210	10/19/93	Gardner et al.			
	5,260,968	11/09/93	Gardner et al.			
	5,262,789	11/16/93	Silverstein			
	5,274,844	12/28/93	Harrison et al.			
	5,283,540	02/01/94	Myer			
	5,299,148	03/29/94	Gardner et al.			
	5,335,249	08/02/94	Krueger et al.			
	5,345,596	09/06/94	Buchenhorner et al.			

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					YES	NO
DS 7-170548	4/7/95	Japan	—	—		X

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DS	Muhammed et al., "Direction of Arrival Estimation Using Antenna Arrays", 1996, The Bradley Dept. of Electrical Engineering, Mobile and Portable Radio Research Group, Section 3.8, pp. 64-71.
DS	vander Veen et al., "A Constant Modulus Factorization Technique for Smart Antenna Applications in Mobile Communications", SPIE 1994 "Advanced Signal Processing Algorithms, Architectures, and Implementations V", Vol. 2296, pp. 230-241.
DS	Talwar et al., "Recursive Algorithms for Estimating Multiple Co-Channel Digital Signals Received at an Antenna Array", Proc. Fifth Annual IEEE Dual Use Technologies and Applications Conference.

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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>P</i>	5,361,303	11/01/94	Eatwell	—	—	
	5,367,559	11/22/94	Kay et al.			
	5,379,320	01/03/95	Fernandes et al.			
	5,387,915	02/07/95	Moussa et al.			
	5,423,072	06/06/95	Iwashita et al.			
	5,430,760	07/04/95	Dent			
	5,440,281	08/08/95	Wey et al.			
	5,448,621	09/05/95	Knudsen			
	5,457,812	10/10/95	Siira et al.			
	5,465,399	11/07/95	Oberholtzer et al.			
	5,471,647	11/28/95	Gerlach et al.			

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## FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

<i>P</i>	Papadias et al., "A Space-Time Constant Modulus Algorithm for SDMA Systems", 1996, Proceedings, IEEE 46th Vehicular Technology Conference, pp. 86-90.
<i>P</i>	Talwar et al., "Blind Estimation of Multiple Co-Channel Digital Signals Arriving at an Antenna Array", 1993, Proc. 27th Asilomar Conference on Signals, Systems, and Computers, Vol. 1, pp. 349-342.
<i>P</i>	Rashid-Farrokhi et al., "Joint Power Control and Beamforming for Capacity Improvement in Wireless Networks With Antenna Array", 1996 IEEE GLOBECOM 1996, Vol. 1, pp. 555-559.

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Ⓚ	5,475,864	12/12/95	Hamabe			
	5,475,868	12/12/95	Duque-Anton et al.			
	5,497,505	03/05/96	Koohgoli et al.			
	5,515,378	05/07/96	Roy, III et al.			
	5,530,449	06/25/96	Wachs et al.			
	5,530,917	06/25/96	Andersson et al.			
	5,532,706	07/02/96	Reinhardt et al.			
	5,537,438	06/16/96	Mourot et al.			
	5,543,801	08/06/96	Shawyer			
	5,546,090	08/13/96	Roy, III et al.			
	5,548,813	08/20/96	Charas et al.			

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Ⓚ	Rashid-Farrokhi et al., "Transmit Beamforming for Cellular Communication Systems", Conference on Information Sciences and Systems, CISS-97; 3/1997, 4 pages.
Ⓚ	Rashid-Farrokhi et al., "Downlink and Uplink Capacity Enhancement in Power Controlled Cellular Systems", Proceedings, 1997 IEEE 47th Vehicular Technology Conference, Vol. 2, 5/97, pp. 647-651.
Ⓚ	Rashid-Farrokhi et al., "Downlink Power Control and Base Station Assignment", IEEE Communications Letters, Vol. 1, No.4, 07/97, pp. 102-104.

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0	5,555,445	09/10/96	Booth			
	5,557,657	09/17/96	Barnett			
	5,565,873	10/15/96	Dean			
	5,566,209	10/15/96	Forssen et al.			
	5,576,717	11/19/96	Searle et al.			
	5,592,490	01/07/97	Barratt et al.			
	5,596,625	01/21/97	LeBlanc			
	5,603,082	02/11/97	Hamabe			
	5,603,089	02/11/97	Searle et al.			
	5,606,729	02/25/97	D'Amico et al.			

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0	Rashid-Farrokhhi et al., "Transmit Diversity and Equalization for Power Controlled Wireless Networks", Conference Record 31st Asilomar Conference on Signals, Systems, and Computers, Vol. 1, 11/97, pp. 620-624.
0	Swidlehurst et al., "Analysis of a Decision Directed Beamformer", IEEE Transactions on Signal Processing, Vol. 43, No. 12, 12/95, pp. 2920-2927.

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DS	5,615,409	03/25/97	Forssen et al.	—	—	
	5,621,752	04/15/97	Antonio et al.			
	5,625,885	04/29/97	Nakazawa et al.			
	5,638,375	06/10/97	Dettro et al.			
	5,649,287	07/15/97	Forssen et al.			
	5,673,291	09/30/97	Dent			
	5,675,581	10/7/97	Soliman			
	5,678,188	10/14/97	Hisamura			
	5,684,836	11/04/97	Nagayasu et al.			
	5,689,219	11/18/97	Piirainen			
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DS	US98/25364, PCT Search Report, 05/11/99.

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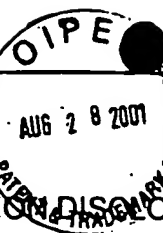
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Sheet 10 of 13

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<input checked="" type="checkbox"/>	5,694,416	12/02/97	Johnson	—	—	
<input checked="" type="checkbox"/>	5,726,978	03/10/98	Frodigh et al.	—	—	
<input checked="" type="checkbox"/>	5,742,904	04/21/98	Pinder et al.	—	—	
<input checked="" type="checkbox"/>	5,745,858	04/28/98	Sato et al.	—	—	
<input checked="" type="checkbox"/>	5,752,165	05/12/98	Hokkanen	—	—	
<input checked="" type="checkbox"/>	5,809,009	09/15/98	Matsuoka et al.	—	—	
<input checked="" type="checkbox"/>	5,809,019	09/15/98	Ichihara et al.	—	—	

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①	5,818,918	10/06/98	Fujii			
	5,819,182	10/06/98	Gardner et al.			
	5,825,762	10/20/98	Kamin, Jr. et al.			
	5,828,658	10/27/98	Ottersten et al.			
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	5,867,123	02/02/99	Geyh et al.			
	5,884,148	03/16/99	Bilgic et al.			
	5,887,038	03/23/99	Golden			
	5,905,721	05/18/99	Liu et al.			
	5,909,470	06/01/99	Barratt et al.			
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<i>de</i>	<b>5,930,243</b>	<b>07/27/99</b>	<b>Parish et al.</b>	—	—	
	<b>5,955,992</b>	<b>09/21/99</b>	<b>Shattil</b>			
	<b>5,970,394</b>	<b>10/19/99</b>	<b>Arpee et al.</b>			
	<b>5,973,638</b>	<b>10/26/99</b>	<b>Robbins et al.</b>			
	<b>5,999,826</b>	<b>12/07/99</b>	<b>Whinnett</b>			
	<b>6,005,854</b>	<b>12/21/99</b>	<b>Xu et al.</b>			
	<b>6,009,124</b>	<b>12/28/99</b>	<b>Smith et al.</b>			
	<b>6,018,317</b>	<b>01/25/00</b>	<b>Dogan et al.</b>			
	<b>6,018,643</b>	<b>01/25/00</b>	<b>Golemon et al.</b>			

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**FOREIGN PATENT DOCUMENTS**

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
					YES	NO

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**


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Sheet **13** of **13**

ATTY. DOCKET NO.

**015685.P031**

SERIAL NO.

**09/676,887**

**INFORMATION DISCLOSURE CITATION**

*(Use several sheets if necessary)*

APPLICANT

**Roger Rogard**

FILING DATE

**09/29/00**

GROUP

**2681**

**U.S. PATENT DOCUMENTS**

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
<i>JO</i>	<b>6,023,203</b>	<b>02/08/00</b>	<b>Parish</b>			
	<b>6,061,553</b>	<b>05/09/00</b>	<b>Matsuoka et al.</b>			
	<b>6,064,865</b>	<b>05/16/00</b>	<b>Kuo et al.</b>			
	<b>6,067,324</b>	<b>05/23/00</b>	<b>Harrison</b>			
	<b>6,108,565</b>	<b>08/22/00</b>	<b>Scherzer</b>			
	<b>6,131,016</b>	<b>10/10/00</b>	<b>Greenstein et al.</b>			
	<b>6,154,661</b>	<b>11/28/00</b>	<b>Goldburg</b>			
	<b>6,185,412</b>	<b>02/06/01</b>	<b>Pentikainen et al.</b>			
	<b>6,192,256</b>	<b>2/20/01</b>	<b>Whinnett</b>			

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DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
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Institute for form 1449A/PTO

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Sheet	1	of	2
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**Complete if Known**

Application Number	09/676,887
Filing Date	September 29, 2000
First Named Inventor	Roger Rogard
Art Unit	2663
Examiner Name	Not yet assigned
Attorney Docket Number	15685P031

U.S. PATENT DOCUMENTS

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				Application Number	09/676,887
				Filing Date	September 29, 2000
				First Named Inventor	Roger Rogard
				Art Unit	2663
				Examiner Name	Not yet assigned
				Attorney Docket Number	15685P031
Sheet	2	of	2		

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Sheet 1 of 1

**Complete if Known**

Application Number	09/676,887
Filing Date	September 29, 2000
First Named Inventor	Roger Rogard
Group Art Unit	2681
Examiner Name	Not Yet Assigned
Attorney Docket Number	15685P031

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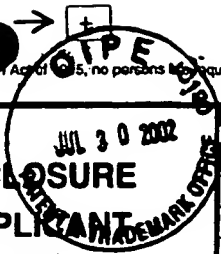
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**Complete if Known**

Application Number	09/676,887
Filing Date	September 29, 2000
First Named Inventor	Roger Rogard
Group Art Unit	2681
Examiner Name	Unassigned
Attorney Docket Number	15685P031

Sheet	1	of	1
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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (use as many sheets as necessary)		Application Number	09/676,887		
		Filing Date	September 29, 2000		
		First Named Inventor	Roger Rogard		
		Art Unit	2663		
		Examiner Name	Not yet assigned		
Sheet		of		Attorney Docket Number	15685P031

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U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.†	Document Number	Publication Date or Issue Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code* (if known)			
JO	1	US-5574977	11-12-1997	Joseph et al.	
	2	US-5619503	04-08-1997	Dent	
	3	US-5625880	04-29-1997	Goldburg et al.	
	4	US-5642353	06-24-1997	Roy III et al.	
	5	US-5684794	11-04-1997	Lopez et al.	
	6	US-5708971	01-13-1998	Dent	
	7	US-5870393	02-09-1999	Yano et al.	
	8	US-5884178	03-16-1999	Ericsson et al.	
	9	US-6037898	03-14-2000	Parish et al.	
	10	US-6141567	10-31-2000	Youssefmir et al.	
	11	US-6219561	04-17-2001	Raleigh	
	12	US-6292664	09-18-2001	Ostrup et al.	
	13	US-6337985	01-08-2002	Roux et al.	
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Examiner Initials*	Cite No.†	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T*
		Country Code* - Number* - Kind Code* (if known)				
JO	14	EP 0 841 827 A2	05-13-1998			

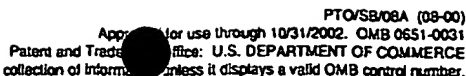
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Based on PTO/SB/08A (06-03) as modified by Blakely, Solokoff, Taylor & Zafman (wtr) 05/02/2003.

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Substitute for form 1449A/PTO				<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				Application Number	09/676,887
				Filing Date	September 29, 2000
				First Named Inventor	Roger Rogard
				Group Art Unit	2681
				Examiner Name	Not Yet Assigned
Sheet	2	of	2	Attorney Docket Number	15685P031

OTHER ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T*
	1	Farsakh et al., "A REAL TIME DOWNLINK CHANNEL ALLOCATION SCHEME FOR AN SDMA MOBILE RADIO SYSTEM," IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, Vol. 3, 10/18/96, pgs. 1215-1220.	
	2	Farsakh et al., "CHANNEL ALLOCATION AND DOWNLINK BEAMFORMING IN AN SDMA MOBILE RADIO SYSTEM," PIMRC '95, Wireless: Merging onto the Information Superhighway, 6th IEEE International Symposium on Toronto, Ont., Canada, 9/27-29/95, pgs. 687-691.	
	3	Gerlach et al., "BASE STATION TRANSMITTER ANTENNA ARRAYS WITH MOBILE TO BASE FEEDBACK," IEEE Asilomar Conference on Signals, Systems & Computers, 1993, pgs. 1432-1436.	

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Application Number	09/676,887
Filing Date	September 29, 2000
First Named Inventor	Roger Rogard
Group Art Unit	2681
Examiner Name	Not Yet Assigned
Attorney Docket Number	15685P031

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Examiner Signature	<i>John [Signature]</i>	Date Considered	<i>21/1/08</i>
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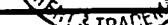
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				Application Number	09/676,887
				Filing Date	September 29, 2000
				First Named Inventor	Roger Rogard
				Group Art Unit	2681
				Examiner Name	Not Yet Assigned
				Attorney Docket Number	15685P031
Sheet	2	of	2		


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Application Number	09/676,887
Filing Date	September 29, 2000
First Named Inventor	Roger Rogard
Group Art Unit	Unassigned
Examiner Name	Unassigned
Attorney Docket Number	15685P031

Sheet	1	of	2
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				Filing Date	September 29, 2000
				First Named Inventor	Roger Rogard
				Group Art Unit	Unassigned
				Examiner Name	Unassigned
Sheet	2	of	2	Attorney Docket Number	15685P031

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